

Summer 2005 trap net monitoring of the fish community in the littoral zone at Brookwood Point and Rat Cove

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INTRODUCTION

Trap net data collection in Rat Cove and Brookwood Point over the summer of 2005 was conducted as a continuation of the monitoring that has taken place since 1979 in Rat Cove (MacWatters 1980) and since 2002 at Brookwood Point (Wayman 2003). Rat Cove and Brookwood Point are littoral zones, meaning light can reach the bottom allowing for abundant aquatic macrophyte growth. Many species of fish, including the alewife (*Alosa pseudoharengus*), use this zone to reproduce and lay eggs (Closs et al. 2004). Alewives were illegally introduced into the lake in 1986 and subsequently reduced zooplankton abundances (Foster 1990). Due to the decrease in the zooplankton populations, as well as increased nutrient loading from the Otsego Lake watershed, there has been an increase in the amount of algal growth in the lake (Harman et. al. 1997).

A walleye (*Sander vitreus*) stocking program was started in 2000 which the New York State Department of Environmental Conservation hoped would provide anglers with a more diverse fishery. The SUNY Oneonta Biological Field Station began monitoring to determine if this stocking would aid in lowering the numbers of alewives in the lake. Trap net data, as well as acoustic data on alewife densities collected by Warner (1999) prior to the walleye stocking and Cornwell (20005), Brooking and Cornwell (2005) and Brooking (2006) following the stocking will hopefully evaluate the efficiency of the walleye stocking program, as well as shed insight into trophic cascade changes, including those related to water quality changes, that may result. Concurrent with this work, the zooplankton community was evaluated bi-weekly (Somerville and Albright 2006), chlorophyll *a* concentrations were measured weekly (Zurmuhlen 2006), and water quality was measured bi-weekly (Albright 2006).

MATERIALS & METHODS

Trap nets were set daily at both Rat Cove and Brookwood Point Monday through Thursday from 24 May to 10 August 2005. Trap nets were set perpendicular on the North shores at each site (Figure 1). Nets were pulled Tuesday through Friday at 0830 hrs. and patched when required. Fish were carefully removed from the nets and held in totes where they were taken back to the Biological Field Station boat dock. Fish were identified, measured in millimeters using a standard measuring board, weighed in grams using a digital scale, and released. Alewives, which tend to die when handled, were not released and were brought back to the lab for further analysis.

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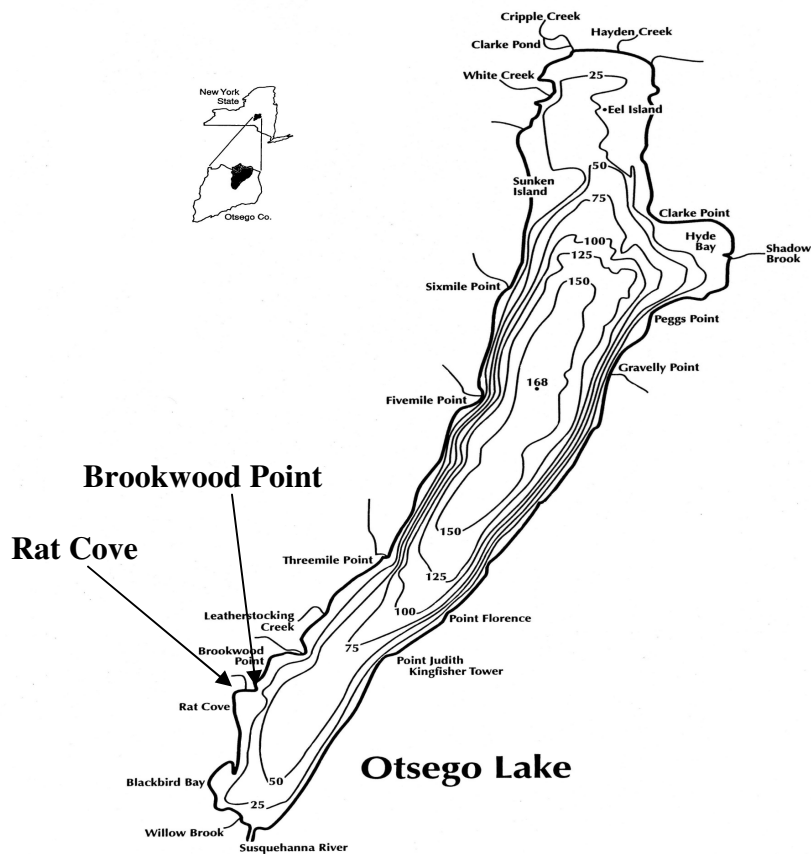


Figure 1. Otsego Lake, showing Rat Cove and Brookwood point, the trap netting sites.

RESULTS & DISCUSSION

The mean catch per week at both Rat Cove and Brookwood Point during 2005 was substantially lower than in past years (Tables 1 and 2). This was mainly a result of a decline in the alewife catch, although numbers of virtually every other littoral species were also lower this year. Figure 2 illustrates the decline in alewife abundance from 2000 to 2005. Over the summer of 2005, the mean alewife catch per set was down from mean of 2.38 alewives per set in 2004 to 0.4 per set at Rat Cove, and from 12.58 alewives per set in 2004 to 5.7 per set at Brookwood Point.

As the alewife abundance has declined, there has been a marked increase in the mean length of the alewives (Figure 3). This is most likely due to reduced intraspecific competition, allowing for higher growth rates. There has also been an increase in large bodied zooplankton in recent years (Albright et al. 2005), which indicates less predation by alewives (Somerville and Albright 2006).

Rat Cove	2000	2001	2002	2003	2004	2005
Mean catch per week	141	96	41	87	25	8.7
Alewife	120.1	67.8	8	45.2	2.4	0.4
Golden Shiner	0.6	0.3	0.4	0.7	0.5	0.3
Pumpkinseed	9.7	20.8	15.1	32.8	12.9	4.6
Blue Gill	2	2.9	3.7	1.7	1.5	1.4
Redbreast Sunfish	0.8	0.6	0.3	0.4	0.3	0.1
Rock Bass	1.6	1.5	3.8	1	1.8	0.5
Largemouth Bass	0.1	0.6	0.3	0.3	0.1	0.1
Chain Pickerel	0.6	0.5	0.1	0.2	0.2	0.1
Atlantic Salmon	0	0.1	0	0.1	0	0
Yellow Perch	2.5	0.5	1.3	0.3	1.2	0.3
White Sucker	1.1	0.2	1.1	0.1	1.9	0.2
Common Carp	0.3	0.3	0.2	0.5	0.3	0.7
Brown Bullhead	1.7	0.1	6.4	2.6	1.6	0.1
Spot Tail Shiner	0	0	0.1	0	0	0
Smallmouth Bass	0	0	0.1	0	0	0
Emerald Shiner	0	0	0	0	0.4	0
European Rudd	0.1	0	0.3	0.7	0.2	0

Table 1. Total mean weekly catch at Rat Cove and the catch contributed by each species, 2000-2005 (modified from Leonard and Cheever 2005).

Brookwood Point	2000	2001	2002	2003	2004	2005
Mean catch per week	258	151	101	121	37	9.4
Alewife	224.2	137.3	77.4	94.7	12.6	5.7
Golden Shiner	0.3	0.3	1.1	1.8	1.6	0.3
Pumpkinseed	3.1	7.4	12	13.1	12.2	1.1
Blue Gill	6.5	0.9	0.9	1	0.8	0.5
Redbreast Sunfish	0.3	0	0.9	0.2	0.7	0.1
Rock Bass	7.7	3.5	4	3.8	3	1.1
Largemouth Bass	0.3	0.3	0.7	0.8	0	0.1
Chain Pickerel	0.3	0	0.3	0.2	0.2	0.2
Atlantic Salmon	0	0.3	0	0	0	0.1
Yellow Perch	1.8	0.3	0.2	0	0.6	0.1
Walleye	0	0	0	0.1	0	0
White Sucker	4.9	0	1.7	0.7	0.6	0.2
Common Carp	2.1	0.3	0.6	0.1	0.3	0
Bluntnose Minnow	0.3	0	0	0	0	0.1
Brown Bullhead	6.7	0	1	3.6	4.2	0
Spot Tail Shiner	0	0.6	0	0	0	0
Smallmouth Bass	0	0	0	0.6	0.2	0
European Rudd	0	0.3	0	0.1	0.2	0
Common Shiner	0	0	0	0	0	0.1

Table 2. Total mean weekly catch at Brookwood Point and the catch contributed by each species, 2000-2005 (modified from Leonard and Cheever 2005).

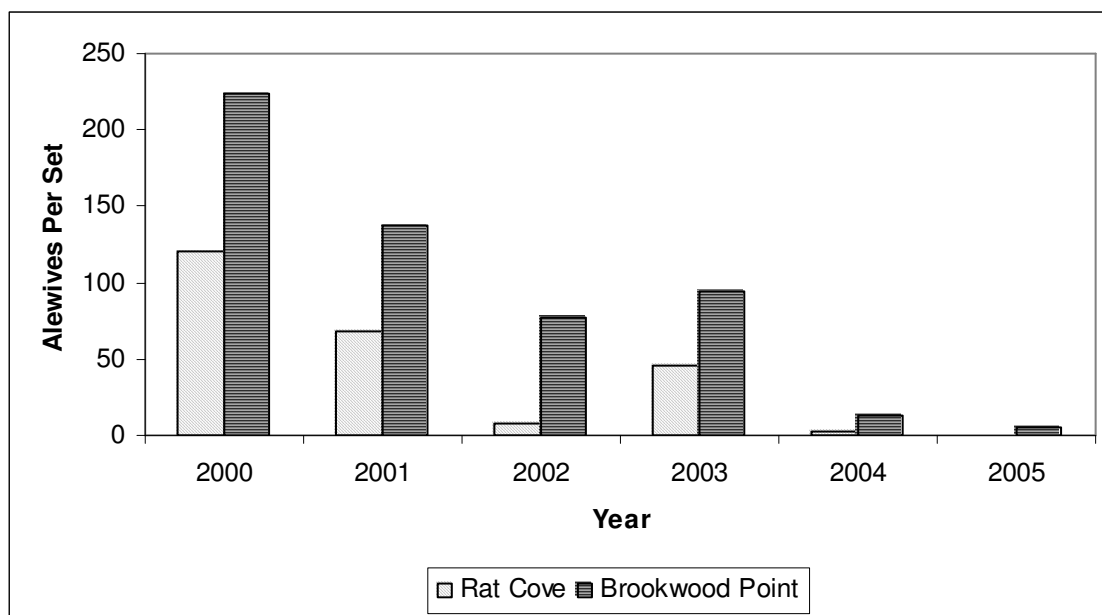


Figure 2. Mean alewife catch per set, 2000-2002 (Gray and Foster 2003), 2003 (Burns 2004), 2004 (Leonard and Cheever 2005), and 2005.

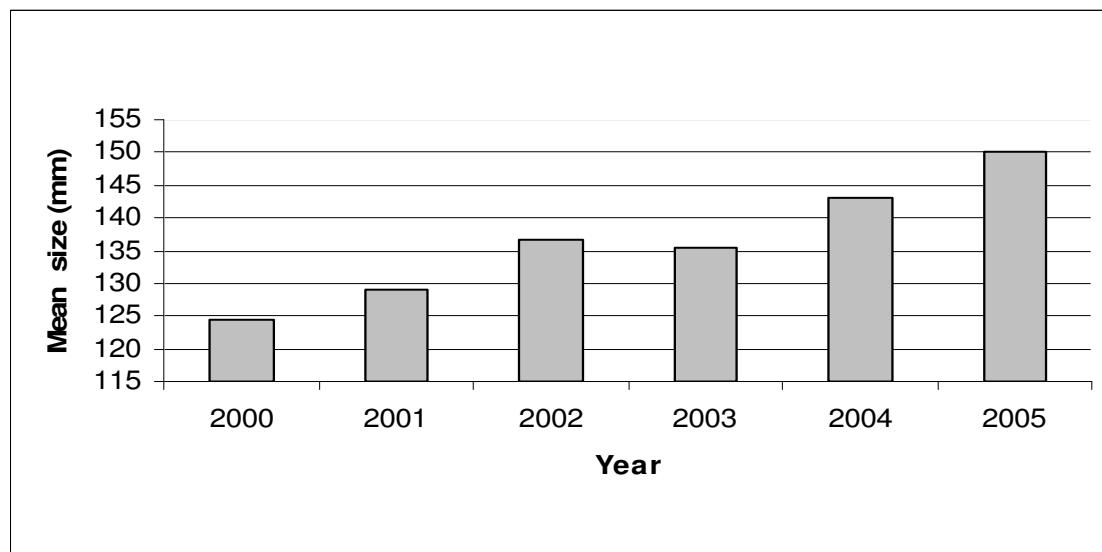


Figure 3. Mean total length of alewives collected in trap nets over the summers of 2000-2004.

Figures 4 and 5 show length frequency histograms for the alewife catches at Rat Cove and Brookwood Point. These graphs show an increase in the size structure of the alewife community compared to any post-establishment year (Leonard and Cheever 2005; Cornwell in press).

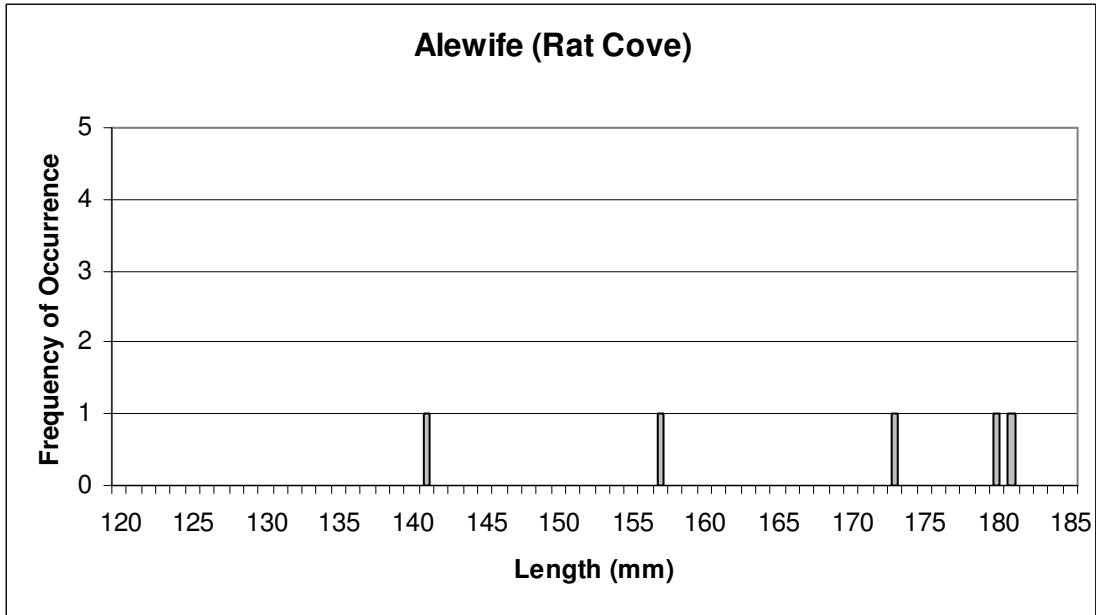


Figure 4. Length frequency histogram of alewife catch at Rat Cove, summer 2005.

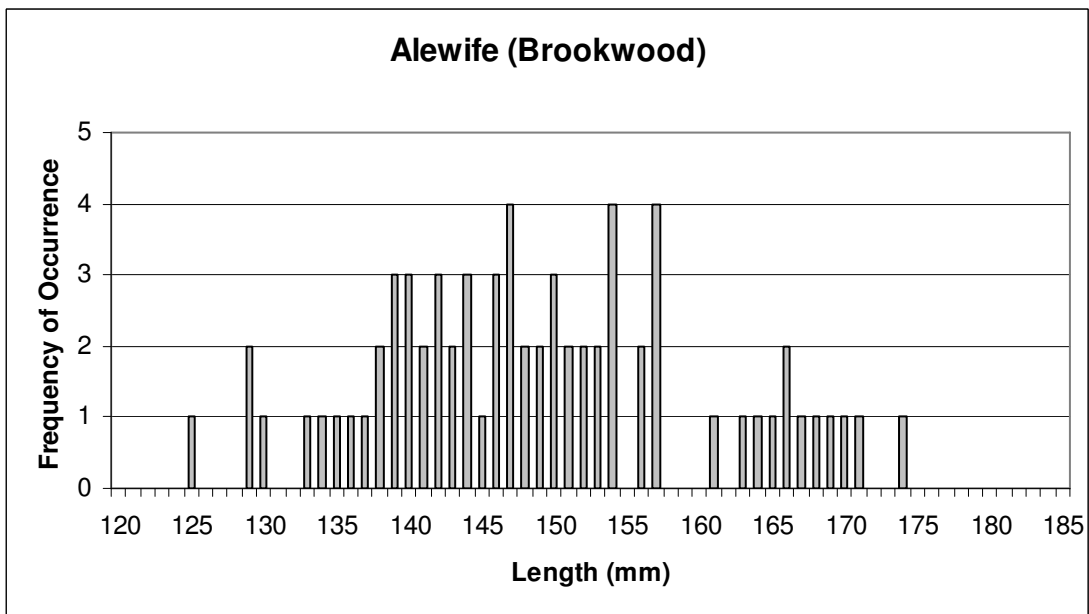


Figure 5. Length Frequency histogram of alewife catch at Brookwood Point, summer 2005.

CONCLUSIONS

Based on this year's trap net data, and those from past years, the trend of alewife abundance is on the decline. In addition, those alewives present are larger. This has been a continuous trend since 2000 when the walleyes were stocked, which suggests that the re-establishment of walleye is having an effect on alewife populations. To better understand the impacts that the walleye are having on alewife abundance and to further monitor Otsego Lake's littoral fish community, Rat Cove and Brookwood Point should continue to be studied using trap nets.

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